



## Fire Management Plan Fire Monitoring

### FIRE MONITORING AT GRAND CANYON

Monitoring our fire management activities is important to the success of our fire program.



Why do we monitor?

- to document basic information about our fire management activities
- to detect trends in fire effects
- to ensure that fire and resource management objectives are being met
- to allow us to practice adaptive management (see right)

What do we monitor?

- fire behavior during prescribed fires and during wildland fire use
- local effects of fire on vegetation using permanently installed plots
- widespread effects of fire through burn severity analysis

Our monitoring program will be modified as needed to accommodate any new information needs prompted by the new fire management plan.

### FIRE EFFECTS MONITORING PLOTS

In 1989, Grand Canyon began installing permanent plots to measure the short-term and long-term effects of fire on vegetation. We currently have over 130 such plots in place throughout the forested areas of the park. The plots are examined immediately before and after prescribed fires, and then are revisited 1, 2, and 5 years later. We collect data on trees, shrubs, herbaceous plants, and fuel load, and use this information in the adaptive management process to assess ecological effects and develop improvements in future fire management practices.



The photos above document changes in a monitoring plot in ponderosa pine forest. From left to right, the photos show the plot immediately before a prescribed fire, one year after the fire, and two years after the fire.

### BURN SEVERITY ANALYSIS

The NPS uses satellite imagery to analyze burn severity for large fires.

This allows us to see which portions of a fire burned at low, moderate, or high intensity, and how those areas are distributed. Burn severity ratings are defined as follows:

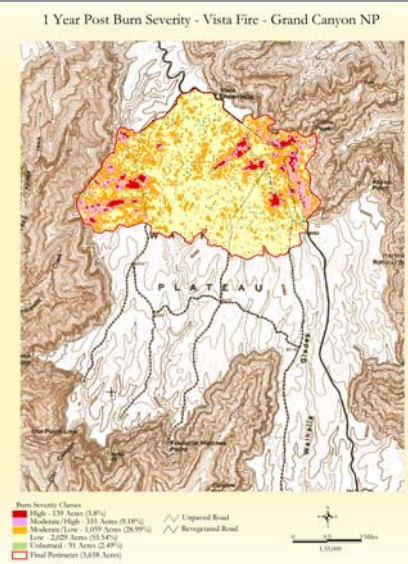
**Unburned:** No evidence of fire.

**Low:** Fire did not kill or alter the dominant vegetation. Small, unburned patches remain, and most foliage and twigs remain intact. Some small organic material on the ground was scorched or consumed.

**Low-to-Moderate:** Some foliage and fine twigs were scorched or consumed. Most overstory green vegetation remains, but some overstory trees were killed. Few unburned patches exist. Most fine organic material on the ground was partially consumed.

**Moderate-to-High:** Fire scorched most of the foliage and fine vegetation, and consumed some. Limited green vegetation remains in overstory, but some overstory trees are expected to survive. Some large logs and most woody debris and smaller organic material were consumed.

**High:** Fire killed the above-ground parts of all vegetation, changing the forest structure substantially. All foliage and fine vegetation was consumed, as well as most large logs and other organic material on the ground.



This type of analysis is an excellent tool for helping us evaluate potential effects of the fire on natural and cultural resources.

The example above is from the Vista Fire, which burned on the North Rim in 2001.

### What is Adaptive Management?

It's a management process in which we...



...which allows us to continuously refine and improve our fire management program

### MONITORING DURING FIRES

The firefighter shown in the background photo is collecting information on fire behavior, such as the height of the flames, and the rate of spread of the fire. This type of information is collected for both prescribed fire and wildland fire use, and helps fire managers determine if the fire is progressing in the way they expected.